University of Tehran Press

Interdisciplinary Journal of Management Studies (IJMS)
Home Page: https://ijms.ut.ac.ir

Online ISSN: 2981-0795

Determinant Factors for the Readiness of Human Resource Information Systems (HRIS) in Public Organizations

Romy Estradha[1*] | Henry Eryanto[2] | Anis Eliyana[3] | Usep Suhud[4] | Umi Widyastuti[5] | Agus Wibowo[6]

1. Corresponding Author, Doctoral Candidate, Faculty of Postgraduates for Management Science, Jakarta State University (UNJ), Indonesia. Email: romy_9917922057@mhs.unj.ac.id
2. Jakarta State University (UNJ), Indonesia. Email: henryeryanto@unj.ac.id
3. Airlangga University, Indonesia. Email: anis.eliyana@feb.unair.ac.id
4. Jakarta State University (UNJ), Indonesia. Email: usuhud@unj.ac.id
5. Jakarta State University (UNJ), Indonesia. Email: umiwidyastuti_feunj@unj.ac.id
6. Instructor, Jakarta State University (UNJ), Indonesia. Email: agus-wibowo@unj.ac.id

ARTICLE INFO

Article type:
Research Article

Article History:
Received 14 June 2023
Revised 17 December 2024
Accepted 28 December 2024
Published Online 01 March 2025

Keywords:
Human resource information system,
Human resource management,
Technology readiness,
SIMPEG,
BPS,
Statistics,
Indonesia.

ABSTRACT

This study aims to identify the factors that can determine Human Resource Information System (HRIS) readiness, in the context of technology readiness in Statistics Central Agency (BPS) as a public organization in Indonesia. This research is related to organizational readiness theory in terms of information technology support according to several references. The research was carried out using a cross-sectional survey with a quantitative approach, consisting of two stages of a questionnaire: first, open questions were posed to 126 respondents; secondly, closed statements were administered to 207 respondents. Questionnaires were randomly distributed to BPS employees throughout Indonesia at headquarters, provinces, and Regency/Municipality BPS Offices. Based on the Exploratory Factor Analysis (EFA), two dimensions were extracted, namely "Perceptions of the HR System Characteristic" and "Perceptions of the HR System Sustainability." Moreover, this study suggests not only focusing on the development process of HRIS, as indicated by the first dimension, but also on maintaining HRIS in accordance with internal and external development processes.

Cite this article: Estradha, R.; Eryanto, H.; Eliyana, A.; Suhud, U.; Widyastuti, U. & Wibowo, A. (2025). Determinant factors for the readiness of Human Resource Information Systems (HRIS) in public organizations. *Interdisciplinary Journal of Management Studies* (*IJMS*), 18 (2), 209-223. http//doi.org/10.22059/ijms.2024.360758.675944

 Publisher: University of Tehran Press.
DOI: http//doi.org/10.22059/ijms.2024.360758.675944

1. Introduction

The rapid advancement of information technology has penetrated various fields (Caldeira & Ward, 2002; Munir & Djaelani, 2022). The industrial revolution's success may be influenced by the digital technology's quick development (Frank et al., 2019; Tsaramirsis et al., 2022), where major changes have occurred in the community and also the organizational environment (Agarwal et al., 2010; Majchrzak et al., 2016). Digital transformation in the public sector or government agencies is vital and unavoidable (Alvarenga et al., 2020; Eom & Lee, 2022). With digital transformation, public organizations or the government sector will become one of the key strategies for improving services to the community, empowering customers, streamlining operations and business processes, and creating new models of the smart cities concept (Curtis, 2019).

Furthermore, for an organization to achieve a competitive advantage, one of the important factors required is the human resources management (Crook et al., 2011; Kraiger et al., 2014). In managing human resources in organizations, one of the factors deemed necessary is how to implement information system-based human resource management (Mauro & Borges-Andrade, 2020). Information technology appears to be the main facilitator for establishing innovative intellectual capital development policies and practices (Noe et al., 2014). According to research conducted by Troshani et al. (2011), the adoption process from the Human Resource Information System (HRIS) to the public sector can be more challenging in comparison to the private sector for various reasons and causes. For example, the basic goals of the public sector are very different from those of the private sector, where the private sector prioritizes economic considerations and profit-making.

In Indonesia, HRIS has become one of the prioritizations in public organizations by the government to process information technology transformation through an Electronic-Based Government System, known as SPBE. The latest publication related to SPBE was issued by the Coordinating Ministry, Ministry of State Apparatus Utilization and Bureaucratic Reform (KemenPAN-RB). Based on this publication, the national SPBE Maturity Level index for 2022 is 2.34 or equivalent to the scale of "Enough" (from four scales: Excellent, Good, Enough, and Poor), with a participation rate of 554 (five hundred and fifty-four) out of 638 (six hundred thirty-eight) Central and Regional Indonesian Government Institution (Indonesia, 2022). From this point of view, it is essential to accelerate the development process in information technology, including how public organizations develop and implement HRIS.

Additionally, several studies have been conducted to measure the level of organizations' readiness to implement HRIS; for instance, the studies conducted by Parasuraman (2000), and Mauro & Borges-Andrade (2020). However, there are still some gaps which can be an opportunity for further studies to address them. Parasuraman (2000) stated that comparative studies of technological readiness across nations, cultures, populations, and time are required. This is noted, along with the rapid development of information technology, and the role of HR management, which is becoming increasingly vital (da Silva et al., 2022). Further studies or research are needed to refine the definition and measurement of the readiness process concerning information systems within organizations, particularly in the context of Human Resources (HR), also referred to as the Human Resource Information System (HRIS). This is especially important for public organizations or government agencies in Indonesia, given its status as a developing country with a large population (Alvarenga et al., 2020). In other words, the acceptance and adoption of HRIS in the public sector remains an under-researched phenomenon (Alkhwaldi et al., 2023). Therefore, the study conducted will contribute to the development of the concept of technology readiness in HR management by determining the factors that can be used to measure HRIS readiness aspects in public organizations.

2. Literature Review

Case studies or research conducted by Broderick & Boudreau (1992) found that the HRIS is closely related to the composition of databases, computer applications, hardware, and software required to collect, store, manage, send, present, and manipulate data on HR. This is also in line with research conducted by Kassim et al (2012) who also found that an organization's human resources can be collected, stored, processed, analysed, retrieved, and distributed using an HRIS. The HR system itself was first implemented in the 1960s as a medium for storing HR data related to employee profiles and descriptions of positions in the organization, including its linkage to the payroll processing function

(Tannenbaum I. Scott, 1990). With the rapid development of information technology and the paradigm of the Industrial Revolution 4.0, da Silva et al. (2022) built a conceptual framework consisting of four components: HR Strategy, HR Management, HR Digitalization, and HR Competence, where HRIS being part of the HR Digitalization component. This component, in its conceptual framework, is expected to support the HR management business processes within the organization, making them more efficient and effective.

Furthermore, the concept of HRIS as a support in the context of viewing organizational readiness theory has received quite significant attention in previous studies. The readiness context is well established in research with the theory of readiness first introduced by Jacobson (1957). One of the applications related to readiness is that it can be observed, for example, on the side of organizational readiness to change, as defined by Weiner (2009). Concerning the technology readiness and its relationship with the process of change in organizations, one of the studies supporting this is research conducted by Xiao et al. (2022). This study investigates the factors that drive the process of digital transformation change in government organizations in China. According to this research, technology readiness plays an important role in the intention to transform within the organization. In addition, to carry out measurements related to the technological aspect, Parasuraman (2000) has built a technology readiness index that can assess technology readiness for customers from both internal and external organizations, so that appropriate decisions can be made related to the process of design, implementation, and managing the relationship between employees and technology. The latest research related to technology readiness was conducted by Mauro & Borges-Andrade (2020) to identify relevant aspects in achieving the potential of HRIS. By reviewing the references that have been described, it can be concluded that technology readiness has been widely used, and in the context of HR/HRIS management, further research can be carried out to identify how technology readiness can support the HR management process in organizations, specifically in government institutions in Indonesia.

Moreover, some previous studies investigated the concept of technology readiness in terms of theories, hypotheses, etc. The first is the research model proposed by Xiao et al. (2022). This research explores the driving factors for digital transformation in local government in China. The research was conducted based on a framework that took three contexts: technology, organization, and environment. To ascertain the variables influencing the intention to undergo transformation, the research model identifies five independent variables. These include citizens' expectations and superior pressure within the environmental context, technology readiness in the technological context, as well as organizational efficiency and public service delivery within the organizational context. The findings demonstrate that the primary driver of local governments' digital transformation is their level of technological readiness (Xiao et al., 2022). Based on this information, government agencies in China should utilize digital technology to its fullest capacity to facilitate digital transformation.

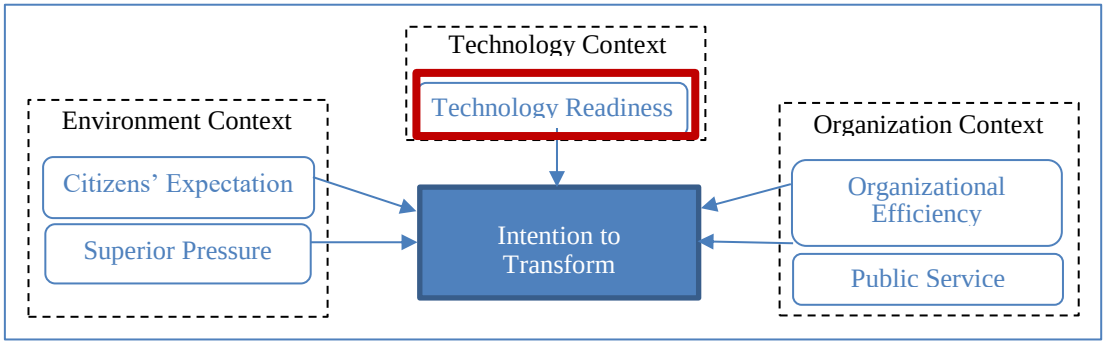

Fig. 1. Conceptual Framework Related to Independent Variables of Organizational Readiness to Change

Next, the previous theory also found references to the article by Alolabi et al. (2021), which compiles a conceptual framework related to variables that can affect readiness at the organizational level for change programs. In the conceptual framework created, five independent variables influence the organizational readiness to change, which is the dependent variable, one of which is the technology variable, as illustrated in Figure 2 below. The study indicates that technology adoption is seen as a crucial area for enhancing the effectiveness of organizational operations (Alolabi et al., 2021).

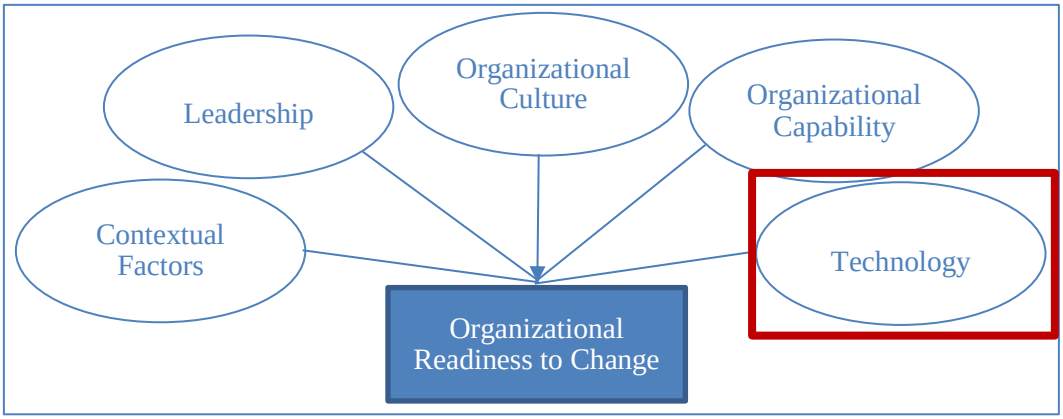

Fig. 2. Conceptual Framework Related to Independent Variables on Organizational Readiness to Change

According to the theory and research findings, several gaps can be identified. First of all, although research conducted by Xiao et al. (2022) has underscored the critical role of technology in the transformation process and organizational readiness to change within Chinese government institutions, it is essential to consider the context of different nations, cultures, populations, and time. Specifically, the technology readiness index, as formulated by Parasuraman (2000), requires comparative analysis when applied to diverse contexts. Parasuraman's index, developed in 2000, was constructed based on a study conducted in the United States of America, involving college students and young professionals surveyed online. Interestingly, it provides an opportunity to conduct a comparative study to determine the measurement using employees of public organization as respondents. The research conducted by Mauro & Borges-Andrade (2020) involved four organizations in Brazil, with a total of 18 respondents, comprising 8 IT professionals and 10 HR professionals. However, Mauro & Borges-Andrade (2020) indicated that the study employed semi-structured interviews, conducted within both private and public organizations. Notably, within public organizations, the implementation process was still ongoing at the time of the study. It, thus, presents an opportunity for this study to be conducted where BPS, as a public organization in Indonesia, has already implemented HRIS, called SIMPEG (Sistem Informasi Manajemen Kepegawaian), as part of its HRM (Human Resources Management) technology readiness in the context of human resource management. Furthermore, in the process of information technology transformation in Indonesia, known as SPBE, BPS is recognized as one of the references in the SPBE context, with a maturity index value in 2022 reaching 381, placing it in the "Excellent" category (Indonesia, 2022). The BPS SPBE index value is one of the highest government institutions, on par with the Ministry of Communication and Information (382), where the difference lies in the fact that BPS has an organizational structure distributed throughout Indonesia, from the Headquarters and Provinces to Regency/Municipality Offices stated in the Regulation (Presidential Regulation No. 86 Year 2007 about Badan Pusat Statistik, 2007), which provides a more comprehensive picture regarding public organizations in Indonesia. Therefore, this study will elaborate on the gap identified and explained in the references above by determining factors or dimensions related to technology readiness in the context of HRIS within Indonesian public organizations, specifically in BPS.

3. Research Methodology

This study aims to identify the dimensions related to HRIS readiness in public organizations, specifically those in Indonesia, one of the developing countries in Asia. Therefore, the study will apply a cross-sectional survey through primary data, using a quantitative approach.

3.1. Sampling and Data Collection

Primary data was collected from one of the public organizations in Indonesia, namely the Statistics Central Agency, also called BPS. It is selected as one of Indonesia's public organizations, for in terms of organizational structure (Presidential Regulation No. 86 Year 2007 about Badan Pusat Statistik, 2007), BPS has working units or representativeness in each Indonesia geographical area, starting from

the headquarter office, to representatives in each province, and down to the regency/municipality levels throughout Indonesia. Furthermore, BPS has implemented the Human Resource Information System (HRIS), known as SIMPEG, as HRM (Human Resources Management) technology readiness in the context of human resource management. The target sample criteria in this study include BPS employees with full-time worker status who already have an account and use SIMPEG BPS.

This research incorporated a purposive sampling method (due to limitations of time and workload issues faced by BPS employees), which was commonly used in technology readiness studies (Genoveva et al., 2023; Peng & Yan, 2022; Taib et al., 2022), targeting BPS employees throughout Indonesia as BPS SIMPEG users, using the Microsoft Office Forms 365 link distributed via the WhatsApp social media platform. The survey was conducted in two stages. The implementation of the first questionnaire, with a quantitative approach, was carried out over five days, from February 10th to February 14th, 2023, while the second questionnaire, again utilizing a quantitative approach, was implemented over five days, from March 6th to March 10th, 2023.

3.2. Measurement and Data Analysis

For the first questionnaire, the study was conducted online, using a quantitative approach through open questions. The first questionnaire consists of three parts, namely screening questions (two questions), core questions (one question), and respondent profiles (five questions). The core question posed was, "What do you think about SIMPEG's readiness for HR management (human resources) at BPS?" The second questionnaire was also carried out online, using a quantitative approach through closed statements which were processed from the results of the first questionnaire. The second questionnaire also consists of three sections, screening questions (two questions), core questions (fourteen questions), and respondent profiles (five questions). The closed statements of the second questionnaire are measured using a Likert instrument with a scale of 1 to 6 (even scale) to avoid respondents choosing a "neutral" position or in the middle (Taherdoost, 2019). It consists of (1) “strongly disagree,” (2) “disagree,” (3) “somewhat disagree,” (4) “somewhat agree,” (5) “agree,” and (6) “strongly agree.”

To determine the dimensions used to view the readiness of SIMPEG BPS as HRM technological readiness, data processing is carried out from the results of a quantitative approach using Exploratory Factor Analysis (EFA) (Hair et al., 2010). According to Ahmad et al. (2020), EFA is a tool that can be used to analyse the strong correlations between a group of variables known as factors, components, or dimensions. Williams et al. (2010) provided evidence for this claim by explaining that how EFA might be used to condense a huge number of variables into a manageable number of variables (referred to as factors, components, or dimensions).

The first stage of the EFA procedure begins with a sample size adequacy test. According to Hair et al. (2019), two criteria are applied: Kaiser Meyer Olkin-Measure of Sampling Adequacy (KMO-MSA) and Bartlett's Test of Sphericity. The KMO-MSA criteria value should fall within the range of 0 and 1. KMO-MSA greater than 0.5 indicates that the data can be used for factor analysis. The second criterion, Bartlett's Test of Sphericity, indicates that the value must be significant ($p < 0.05$) to conclude that factor analysis is appropriate. The next stage is to use one of the extraction methods, principal component analysis (PCA), to condense a large number of variables into dimensions. Williams et al. (2010) stated that other methods, such as Eigenvalue and cumulative percent of extracted variance, can be employed to determine factor extraction. This study employed all criteria for the factor extraction procedure. The rotation method, a further criterion in determining factor extraction, is related to the final stage. Oblique rotation was used in this study to represent uncorrelated factors. Oblique rotation represents the complexity of the tested variables more accurately because real-world constructs are rarely uncorrelated (Harman, 1976).

Moreover, the dimension from the EFA results was tested for reliability. Cronbach's alpha is a commonly used and accepted measure for calculating reliability values; if the alpha coefficient value is above 0.7, it can be considered reliable (Hinkin, 1998). Lastly, the results of the Exploratory Factor Analysis are determined by labelling the components obtained based on several references as a comparison and are also associated with theories or hypotheses from previous studies.

4. Results and Discussion

4.1. Respondent Profile/Demography Respondent

Data related to the profile of respondents is intended to present a description of them in this study. This research uses BPS employees throughout Indonesia as respondents because BPS SIMPEG users are BPS employees who are distributed at Headquarter BPS, Provincial BPS, and Regency/Municipal BPS Offices. From the implementation of the survey conducted, answers were obtained, totalling 126 respondents for the first questionnaire, and 207 respondents for the second questionnaire. Respondents were grouped based on demographic factors in the questionnaires, namely: Working Unit, Position, Gender, Age Group, and Education.

Firstly, it can be inferred from the following Table that the majority taking part in this survey were BPS employees with undergraduate and master educational backgrounds (92.86% on the first questionnaire, and 74.39% on the second questionnaire). Secondly, concerning their positions, the majority of respondents were BPS employees at the functional level, particularly in expertise, skills, and general levels, totally accounting for 91.27% in the first questionnaire, and 87.93% in the second questionnaire. Thirdly, the equality distribution can be observed, in the context of gender and age group characteristics, the respondents were distributed equally across each level. However, at the working unit level, the percentage of respondents at each level varied due to different workload factors (between headquarters and regency/municipality offices) during the implementation of the first and second questionnaires. The number of respondents based on each characteristic is represented in the following Table:

Table 1. Demographics of Respondents (Data Processed, 2023)

No	Information Group	1st Questionnaire		2nd Questionnaire	
		Sum	Percentage (%)	Sum	Percentage (%)
		N = 126		N = 207	
1	Gender:				
	(1) Male	65	51.59%	122	58.94%
	(2) Female	61	48.41%	85	41.06%
2	Age Group				
	(1) < 20 years old	0	0.00%	0	0.00%
	(2) 20-24 years old	4	3.17%	2	0.97%
	(3) 25-29 years old	11	8.73%	18	8.70%
	(4) 30-34 years old	27	21.43%	33	15.94%
	(5) 35-39 years old	20	15.87%	48	23.19%
	(6) 40-44 years old	20	15.87%	30	14.49%
	(7) 45-49 years old	19	15.08%	26	12.56%
	(8) 50 years old and above	25	19.84%	50	24.15%
3	Education				
	(1) Senior High School and Below	4	3.17%	30	14.49%
	(2) Diploma I-III	5	3.97%	22	10.63%
	(3) Undergraduate (S1)-Diploma IV	70	55.56%	105	50.72%
	(4) Master	47	37.30%	49	23.67%
	(5) Doctorate	0	0.00%	1	0.48%
4	Position				
	(1) JPT Pratama (Echelon II)	1	0.79%	0	0.00%
	(2) Administrator (Echelon III)	6	4.76%	16	7.73%
	(3) Supervisor (Echelon IV)	4	3.17%	9	4.35%
	(4) Functional: Expertise Level	68	53.97%	74	35.75%
	(5) Functional: Skills Level	15	11.90%	38	18.36%
	(6) General Functional/Staff	32	25.40%	70	33.82%
5	Working Unit				
	(1) BPS Headquarter	53	42.06%	17	8.21%
	(2) BPS Province	24	19.05%	37	17.87%
	(3) BPS Regency/Municipal	49	38.89%	153	73.91%

4.2. Exploratory Factor Analysis (EFA)

From the results of the collected questionnaire answers, coding was then carried out on the respondents' answers by grouping/categorizing them based on the uniformity of the answers obtained. The categorization of the answers to the questionnaire, using a quantitative approach for open

questions, then becomes the basis for compiling closed statements in the next questionnaire that also employs a quantitative approach. The closed statements that are processed consist of 14 categories, namely: (1) Interface Visualization/Attractive Appearance, (2) Simple Design and Flow, (3) Fast and Responsive Access, (4) Informative HR Data, (5) Complete and Up to date HR Data, (6) Informative HR Archives, (7) Complete and Up to date HR Archives, (8) Benefits for Employee Needs, (9) Benefits for HR Management Needs, (10) Ease in Making Decisions, (11) Adequate Supporting Infrastructure (VPN, Network etc.), (12) Integrated with Other Systems, (13) Need for Additional Features and Modules, and (14) Need for Development/Improvement.

Furthermore, from the implementation of Factor Analysis process, several Tables were taken as output. The first is the Total Variance Explained Table. This Table represents the total value and cumulative percentage in the extraction sums of the squared loading column, where the values obtained consist of a cumulative percentage value of 73.777% (with a minimum reference of 60%), and the total value of two components is 1.419 (above 1), respectively (Hinkin, 1998). The values in the Total Variance Explained Table can be seen as follows:

Table 2. Total Variance Explained (Data Processed, 2023)

Com ponent	Initial Eigenvalues			Extraction Sums of Squared Loadings			Rotation Sums of Squared Loadings
	Total	Variance%	Cumulative %	Total	Variance%	Cumulative %	Total
1	8.172	62.858	62.858	8.172	62.858	62.858	7.687
2	1.419	10.919	73.777	1.419	10.919	73.777	5.274
3	.779	5.989	79.766				
4	.547	4.211	83.976				
5	.463	3.565	87.541				
6	.387	2.980	90.521				
7	.280	2.154	92.675				
8	.243	1.870	94.545				
9	.214	1.649	96.194				
10	.179	1.375	97.569				
11	.121	.928	98.497				
12	.110	.849	99.347				
13	.085	.653	100.000				

To categorize the components that make up the factor and compute the loading factor of each item, the rotation approach utilizing varimax rotation is used. According to Hinkin (1998), the loading factor must be more than 0.4; therefore, the data processing employs Factor Analysis using a minimum absolute value of 0.4 with the Direct Oblimin Rotation Method. In the pattern matrix Table, there is one item that has a value in both components, component 1 and component 2, namely item 10. Thus, item 10 is then removed, and factor analysis is processed again, to measure reliability, with a minimum component consisting of two or more statement items.

Based on the data processing, it can be observed that the pattern matrix table of 13 categories meets the requirements for each component as follows: From processing, the output obtained is in the form of a pattern matrix with the appearance of two or more components. There are nine items in the first component or factor, namely items 1, 2, 3, 4, 5, 6, 7, 11, and 12. The second component or factor consists of four items, including items 8, 9, 13, and 14. Details of the loading factor for each item are presented in the following Table below:

Table 3. Pattern Matrix (Data Processed, 2023)

Items	Component	
	1	2
S3 Fast and Responsive Access	.971	
S1 Interface Visualization/Attractive Appearance	.879	
S7 Complete and Up to date HR Archives	.877	
S2 Simple Design and Flow	.857	
S5 Complete and Up-to-date HR Data	.853	
S4 Informative HR Data	.802	
S6 Informative HR Archives	.763	
S11 Adequate Supporting Infrastructure (VPN, Network, etc.)	.687	
S12 Integrated with Other Systems	.670	
S14 Need for Development/Improvement		.950
S13 Need for Additional Features and Modules		.787
S9 Benefits for HR Management Needs		.738
S8 Benefits for Employee Needs		.696

Furthermore, after processing the Analysis Factor and its explanation, the study also conducts a reliability analysis to ensure the reliability of the components formed from the results of the data processing. From the process of reliability analysis, the values of all 13 factors formed is above 0.7; thus, it can be stated that the components formed from this study are reliable (Ghozali, 2009; Hair et al., 2006).

4.3. Labelling the Dimensions

After implementing the process of Exploratory Factor Analysis (EFA) and Reliability Analysis, the two components/factors that have been extracted will be named based on references from previous studies. In this case, the components of the SIMPEG readiness context in BPS HR management are associated with related research from the information technology side of HR management, one of which is HRM technology readiness. Upon reviewing the references from previous studies, the theory related to technology readiness was put forward by Parasuraman (2000), where the Technology Readiness Index (TRI) is measured using four dimensions with two groups: optimism and innovativeness, which are considered drivers/motivators of technology readiness, while discomfort and insecurity are included in the group of inhibitors. The TRI reference from Parasuraman (2000) has been extensively utilized in research related to technology readiness (Blut & Wang, 2020; Erdoğmu & Esen, 2011; Nugroho & Andryzal Fajar, 2017; Odlum, 2016; Zaman et al., 2020).

Furthermore, Blut & Wang (2020) meta-analysis research comprising Technology Readiness, indicates that Technology Readiness can best be conceptualized using the construction of two groups of differentiating dimensions, the first being Contributors or those who make a positive contribution to organizational technology readiness, consisting of optimism and innovativeness. The second group is called Inhibitors or, also, challenges or obstacles in terms of organizational technology readiness, consisting of insecurity and discomfort.

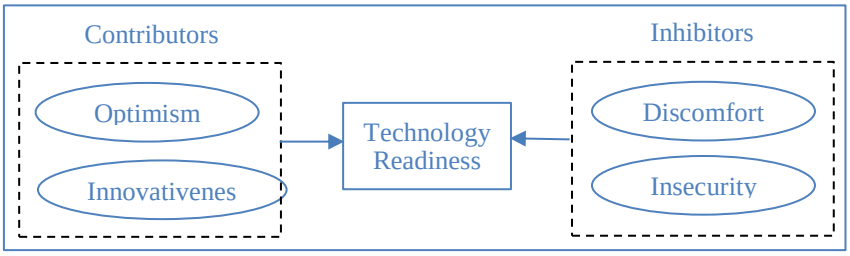

Fig. 3. Technology Readiness Index (TRI) (Blut & Wang, 2020; Parasuraman, 2000)

In addition, Mauro & Borges-Andrade (2020) research study reveals innovations related to HR information systems that are important in organizations. The research was conducted on a combination of information technology specialists (IT Professionals) and HR specialists (HR Professionals) in four different organizations to identify the stages in the implementation of the HR information system. The research results discovered the important or vital aspects related to the process of adopting an HR

information system or HRIS, namely: The results of the system, characteristics of the system, the implementation process, and the HRM model. Thus, from the two research references a comparison can be made regarding the components of the results of the research carried out thereafter, serving as one of the bases in the process of libelling the two components that have been obtained from the results of research data processing.

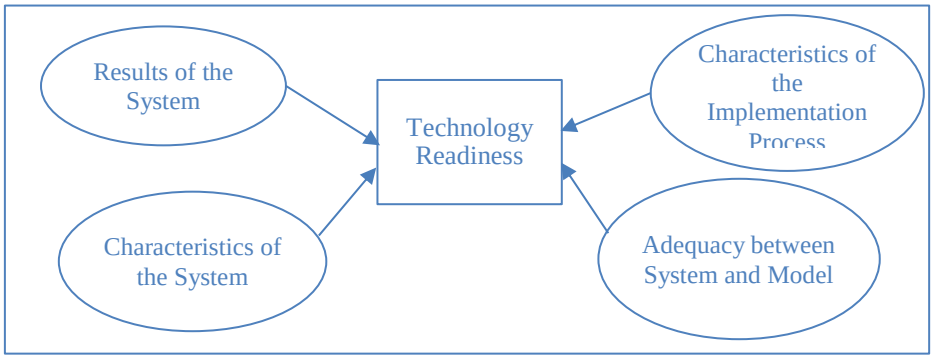

Fig. 4. Category of Perception in HRIS Implementation from HR and IR Professional Perspective (Mauro & Borges-Andrade, 2020)

Table 4. The Dimensions Obtained from the Processed Results Are Being Compared with Related References

Research Result (2023)	*Mauro & Borges-Andrade* (2020)	(Blut & Wang, 2020; Erdoğmu & Esen, 2011; Nugroho & Andryzal Fajar, 2017; Odlum, 2016; Zaman et al., 2020) adopted from Parasuraman (2000)
1st Component: • Fast and Responsive Access • Interface Visualization/Attractive Appearance • Complete and Up-to-date HR Archives • Simple Design and Flow • Complete and Up-to-date HR Data • Informative HR Data • Informative HR Archives • Adequate Supporting Infrastructure (VPN, Network, etc.) • Integrated with Other Systems 2nd Component: • Need for Development/Improvement • Need for Additional Features and Modules • Benefits for HR Management Needs • Benefits for Employee Needs	**1. Results of the System** ○ "Enabling the Execution of HR Process" ○ "Individual Development of the Employee" ○ "Broadening of the View of the Employees" ○ "Quality of the HR Processes" ○ "Flexibility to Respond to Demands" ○ "Autonomy for Employees to Perform Operations" ○ "Access to Information by Employees and Managers" **2. Characteristics of the systems** ○ "Friendly and Familiar Interface" ○ "Ease of Use" ○ "Useful" ○ "Stable" ○ "Flexible" **3. Characteristics of the Implementation Process** ○ "Application of Methods and Techniques of Project Management" ○ "Promotion of Actions to Increase Peoples' Confidence in the System" ○ "Qualification of the Users" ○ "Requirements Elicitation" ○ "Organization's Culture Management" ○ "Stakeholder Expectation Management" **4. Adequacy between System and Model** ○ "Customization/ Parameterization"	**1. Contributors** **a. Optimism** ○ "Technology gives people more control over their daily lives" ○ "Products and services that use the newest technologies are much more convenient to use" ○ "You like the idea of doing business via computers because you are not limited to regular business hours" ○ "You prefer to use the most advanced technology available" ○ "You like computer programs that allow you to tailor things to fit your own needs" ○ "Technology makes you more efficient in your occupation" ○ "You find new technologies to be mentally stimulating" ○ "Technology gives you more freedom of mobility" ○ "Learning about technology can be as rewarding as the technology itself" ○ "You feel confident that machines will follow through with what you instructed them to do" **b. Innovativeness** ○ "Other people come to you for advice on new technologies" ○ "It seems your friends are learning more about the newest technologies than you are [reverse scored]" ○ "In general, you are among the first in your circle of friends to acquire new technology when it appears" ○ "You can usually figure out new high-tech products and services without help from others" ○ "You keep up with the latest technological developments in your areas of interest" ○ "You enjoy the challenge of figuring out high-tech gadgets" ○ "You find out that you have fewer problems than other people in making technology work for you"

Research Result (2023)	*Mauro & Borges-Andrade* (2020)	(Blut & Wang, 2020; Erdoğmu & Esen, 2011; Nugroho & Andryzal Fajar, 2017; Odlum, 2016; Zaman et al., 2020) adopted from Parasuraman (2000)
		2. Inhibitors **a. Discomfort** o "Technical support lines are not helpful because they don't explain issues in terms you understand" o "Sometimes, you think that technology systems are not designed for use by ordinary people" o "There is no such thing as a manual for a high-tech product or service that's written in plain language" o "When you get technical support from a provider of a high-tech product or service, you sometimes feel as if you are being taken advantage of by someone who knows more than you do" o "If you buy a high-tech product or service, you prefer to have the basic model over one with a lot of extra features" o "It is embarrassing when you have trouble with a high-tech gadget while people are watching" o "There should be caution in replacing important people-tasks with technology because new technology can breakdown or get disconnected" o "Many new technologies have health or safety risks that are not discovered until people have used them" o "New technology makes it too easy for governments and companies to spy on people" o "Technology always seems to fail at the worst possible time" **b. Insecurity** o "You do not consider it safe to give out a credit card number over a computer" o "You do not consider it safe to do any kind of financial business online" o "You worry that information you send over the Internet will be seen by other people" o "You do not feel confident doing business with a place that can only be reached online" o "Any business transaction you do electronically should be confirmed later with something in writing" o "Whenever something gets automated, you need to check carefully that the machine or computer is not making mistakes" o "The human touch is very important when doing business with a company" o "When you call a business, you prefer to talk to a person rather than a machine" o "If you provide information to a machine or over the Internet, you can never be sure it really gets to the right place"

The comparison Table highlights several agreements with the dimensions of technology readiness observed in previous studies. In the first component, there are similarities in the statement items in the Contributors dimension group, especially in the optimism and innovativeness dimensions identified by Parasuraman (2000). These findings are consistent with the results regarding system characteristics studied by Mauro & Borges-Andrade (2020). On the second component, the results of data processing were conducted; even though there is alignment with the implementation process and the HRM model of Mauro & Borges-Andrade (2020), there are slight differences or new findings, where this component highlights aspects more related to the sustainability of the development of the HR information system itself.

Thus, following existing theories from previous research references, a labelling process was carried out based on the understanding of the respondents, which means based on the perceptions of the respondents at the BPS-Statistics Indonesia. Relevant perceptions were obtained from the results of a

survey that was carried out in conjunction with HRM Technology Readiness through the question, "How ready is SIMPEG BPS as Supporting Information Technology in HR Management at BPS?" Therefore, the following dimensions can be named from the results of the components obtained:

Table 5. Labelling the Dimensions

No.	Dimension Name	Item No.	Item	Loading Factor
1	Perceptions of the HR System Characteristic	S3	Fast and Responsive Access	.971
		S1	Interface Visualization/Attractive Appearance	.879
		S7	Complete and Up-to-date HR Archives	.877
		S2	Simple Design and Flow	.857
		S5	Complete and Up-to-date HR Data	.853
		S4	Informative HR Data	.802
		S6	Informative HR Archives	.763
		S11	Adequate Supporting Infrastructure (VPN, Network, etc.)	.687
		S12	Integrated with Other Systems	.670
2	Perceptions of the HR System Sustainability	S14	Need for Development /Improvement	.950
		S13	Need for Additional Features and Modules	.787
		S9	Benefits for HR Management Needs	.738
		S8	Benefits for Employee Needs	.696

4.4. Discussion

This research aimed to identify the factors that can determine Human Resource Information System (HRIS) readiness, also called SIMPEG, in the context of technology readiness to support HR Management in the Statistics Central Agency (BPS) as a public organization in Indonesia. In comparison with the previous studies, the findings in this research specifically differ in several aspects: The methodological and sampling approach, including the location of the study as well as the dimensions found with its items sequentially.

The use of a two-stage questionnaire approach, incorporating both quantitative and qualitative methods, allowed for a thorough exploration of the topic. One of the standout aspects of this research is the sampling approach. By collecting data from the employees of Statistics Central Agency (BPS) throughout Indonesia, including offices at different levels (Headquarters, Provinces, and Regencies/Municipalities), the diversity and representativeness of sample is ensured, thereby enhancing the generalizability of the findings.

The study identified two dimensions, namely "Perceptions of the HR system characteristics" and "Perceptions of the HR system sustainability," to showcase the depth of the investigation. Moreover, the novelty of introducing the dimension related to perceptions of the sustainability of the HR system with different items, specifically with the S14 item, “the need for development,” and S13 item, “the need for additional features/modules,” set the study apart from previous research references that have been conducted by several scholars (Mauro & Borges-Andrade, 2020; Parasuraman, 2000). In comparison, the technology readiness index, as established by Parasuraman (2000), was created in 2000. The study was conducted in the United States of America and involved college students and young professionals through an online survey. On the other hand, the research conducted by involved four organizations in Brazil, with a total of 18 respondents (8 IT Professionals and 10 HR Professionals). Therefore, further research can be done to challenge the findings of these new items to determine the compatibility compared with previous research conducted using the measurement from Parasuraman (2000) or Mauro & Borges-Andrade (2020). This study, employing a new multidimensional measurement approach and utilizing a mixed-method methodology, was conducted within one of Indonesia's public organizations. The study, spanned across headquarters, provinces, and regencies/municipalities in Indonesia, aims to contribute to and strengthen the concept of technology readiness within HR management.

In addition, this study has surely some limitations regarding the supporting theories as there are potential other theories that have not been covered in the research, particularly related to the use of more public organizations. However, it can be argued that the study offers significant contributions to the field of HR management and information technology readiness. The findings provide a solid foundation for supporting several conceptual framework theories that have been found by Xiao et al. (2022), and Alolabi et al. (2021), which have been proven as the critical factor of technology in the process of transformation and organization readiness to change. Furthermore, the findings provide

solid and well-structured dimensions for future research to test and validate these further. The practical implications stress the potential to guide policy-making processes and support organizations in implementing HRIS effectively.

5. Conclusion

This research is aimed at capturing the dimensions that can be used to measure organizational readiness theory in terms of supporting information technology readiness in human resource management (HRM). The study was conducted by taking samples from the employees of Statistics Central Agency (BPS) throughout Indonesia (from Headquarters and Provinces to Regency/Municipality Offices) by conducting two stage questionnaires. The first of which was carried out using a quantitative approach with an open question, "How ready is SIMPEG BPS for Supporting Information Technology in HR Management at BPS as a Public Organization?" which was followed by a second questionnaire with closed questions where categorization/groups were taken based on the answers from the previous questionnaire. The results of the research involve proposing propositions from two dimensions that have been found: Perceptions of the HR system characteristics and Perceptions of the HR system sustainability. From a novelty perspective, the emergence of dimensions related to perceptions of the sustainability of the HR system has not been identified in previous research references. With these findings, hopefully, testing each of these dimensions can continue in further research.

Given the study's dimensions and their practical implications, it is recommended to concentrate not only on the HRIS development process—as suggested by the first dimension (HR System Characteristic)—but also on how HRIS can be maintained in the face of continuous advancements in information technology, both internally and externally (HR System Sustainability) (da Silva et al., 2022; Rajawat & Sharma, 2022; Sidek et al., 2022; Xiao et al., 2022). For instance, in the Indonesian context, there are still several public organizations that have not yet implemented HRIS fully, as the process of information technology transformation has become one of the prioritization processes through an Electronic-Based Government System, known as SPBE. Consequently, the result of this study can be used in measuring the readiness of organizations in the context of HRIS implementation and also contribute to the policy-making process when formulating policies related to supporting information technology readiness and the development process of HRIS.

5.1. Limitations and Recommendations

This research study has certainly some limitations. Firstly, it can be seen from the point of view of theoretical limitations, where several theories related to technological readiness were only examined in this study, not excluding the possibility of other theories that have not been covered in the research. Secondly, the sampling technique used in this research, specifically purposive sampling, is due to time limitations and also the high workload faced by BPS employees. While this approach can be suitable for exploratory research, it is important to acknowledge that this sampling technique has limitations and potential biases associated with non-probability sampling (Tansey, 2009). Thirdly, it is also more beneficial to consider further studies complementing other research methods, such as qualitative interviews or focus groups, to gain a more in-depth understanding of the factors influencing HRIS readiness. Lastly, the items and dimensions obtained are the result of an exploration looking at the HRM Technology Readiness aspect of the BPS, as a public organization or Non-Ministry Government Agency (LPNK) in Indonesia. Thus, it is recommended that further research be carried out by involving more public organizations in Indonesia (Ministries, Other Agencies, and Local Governments) for the research to be generalized.

6. Acknowledgement

The authors would like to thank the editors and reviewers who helped this article's quality improve significantly.

References

Agarwal, R., Gao, G. G., DesRoches, C., & Jha, A. K. (2010). The digital transformation of healthcare: Current status and the road ahead. *Information Systems Research*, *21*(4), 796–809. https://doi.org/10.1287/isre.1100.0327

Ahmad, G. N., Widyastuti, U., Susanti, S., & Mukhibad, H. (2020). Determinants of the islamic financial literacy. *Accounting*, *6*(6), 961–966. https://doi.org/10.5267/j.ac.2020.7.024

Alkhwaldi, A. F., Alobidyeen, B., Abdulmuhsin, A. A., & Al-Okaily, M. (2023). Investigating the antecedents of HRIS adoption in public sector organizations: integration of UTAUT and TTF. *International Journal of Organizational Analysis*, *31*(7), 3251–3274. https://doi.org/10.1108/IJOA-04-2022-3228

Alolabi, Y. A., Ayupp, K., & Al Dwaikat, M. (2021). Issues and implications of readiness to change. *Administrative Sciences*, *11*(4), 140. https://doi.org/10.3390/admsci11040140

Alvarenga, A., Matos, F., Godina, R., & Matias, J. C. O. (2020). Digital transformation and knowledge management in the public sector. *Sustainability (Switzerland)*, *12*(14), 5824. https://doi.org/10.3390/su12145824

Blut, M., & Wang, C. (2020). Technology readiness: a meta-analysis of conceptualizations of the construct and its impact on technology usage. *Journal of the Academy of Marketing Science*, *48*(4), 649–669. https://doi.org/10.1007/s11747-019-00680-8

Broderick, R., & Boudreau, J. W. (1992). Human resource management, information technology, and the competitive edge. *Academy of Management Perspectives*, *6*(2), 7–17. https://doi.org/10.5465/ame.1992.4274391

Caldeira, M. M., & Ward, J. M. (2002). Understanding the successful adoption and use of IS/IT in SMEs: An explanation from Portuguese manufacturing industries. *Information Systems Journal*, *12*(2), 121–152. https://doi.org/10.1046/j.1365-2575.2002.00119.x

Crook, T. R., Todd, S. Y., Combs, J. G., Woehr, D. J., & Ketchen, D. J. (2011). Does human capital matter? a meta-analysis of the relationship between human capital and firm performance. *Journal of Applied Psychology*, *96*(3), 443–456. https://doi.org/10.1037/a0022147

Curtis, S. (2019). Digital transformation—the silver bullet to public service improvement? *Public Money and Management*, *39*(5), 322–324. https://doi.org/10.1080/09540962.2019.1611233

da Silva, L. B. P., Soltovski, R., Pontes, J., Treinta, F. T., Leitão, P., Mosconi, E., de Resende, L. M. M., & Yoshino, R. T. (2022). Human resources management 4.0: Literature review and trends. *Computers and Industrial Engineering*, *168*, 108111. https://doi.org/10.1016/j.cie.2022.108111

Eom, S. J., & Lee, J. (2022). Digital government transformation in turbulent times: Responses, challenges, and future direction. In *Government Information Quarterly* (Vol. 39, Issue 2, p. 101690). Elsevier. https://doi.org/10.1016/j.giq.2022.101690

Erdoğmu, N., & Esen, M. (2011). An investigation of the effects of technology readiness on technology acceptance in e-HRM. *Procedia - Social and Behavioral Sciences*, *24*, 487–495. https://doi.org/10.1016/j.sbspro.2011.09.131

Frank, A. G., Dalenogare, L. S., & Ayala, N. F. (2019). Industry 4.0 technologies: Implementation patterns in manufacturing companies. *International Journal of Production Economics*, *210*, 15–26. https://doi.org/10.1016/j.ijpe.2019.01.004

Genoveva, Syahrivar, J., & Ariestiningsih, E. S. (2023). Technology Readiness During the COVID-19 Pandemic: Lessons Learned from Indonesia. *CommIT Journal*, *17*(1), 93–102. https://doi.org/10.21512/commit.v17i1.8068

Ghozali, I. (2009). Econometrics theory, concepts, and applications with SPSS 17. In *Semarang: Badan Penerbit Universitas Diponegoro*.

Hair, J. F., Black, W. C., Babin, B. J., & Anderson, R. E. (2010). *Multivariate data analysis: Global edition*. NJ: Pearson Higher Education Upper Saddle River.

Hair, J. F., Black, W. C., Babin, B. J., & Anderson, R. E. (2019). *Multivariate Data Analysis*. Cengage. https://books.google.co.id/books?id=0R9ZswEACAAJ

Hair, J. F., Black, W. C., Babin, B. J., Anderson, R. E., & Tatham, R. L. (2006). *Multivariate data analysis (Vol. 6)*. Upper Saddle River, NJ: Pearson Prentice Hall.

Harman, H. H. (1976). *Modern factor analysis*. University of Chicago press.

Hinkin, T. R. (1998). A brief tutorial on the development of measures for use in survey questionnaires. *Organizational Research Methods*, *1*(1), 104–121. https://doi.org/10.1177/109442819800100106

Indonesia. (2022). *Laporan Pelaksanaan Pemantauan dan Evaluasi SPBE 2022*. https://www.menpan.go.id/site/publikasi/unduh-dokumen/buku/file/6796-5-buku-laporan-pelaksanaan-pemantauan-dan-evaluasi-spbe-tahun-2022

Jacobson, E. H. (1957). The effect of changing industrial methods and automation on personnel. *Symposium on Preventive and Social Psychiatry, Washington, DC*.

Kassim, N. M., Ramayah, T., & Kurnia, S. (2012). Antecedents and outcomes of human resource information system (HRIS) use. *International Journal of Productivity and Performance Management*, *61*(6), 603–623. https://doi.org/10.1108/17410401211249184

Kraiger, K., Passmore, J., Santos, N. R. dos, & Malvezzi, S. (2014). The Psychology of Training, Development, and Performance Improvement. In *The Wiley Blackwell Handbook of the Psychology of Training, Development, and Performance Improvement*. https://doi.org/10.1002/9781118736982.ch1

Majchrzak, A., Markus, M. L., & Wareham, J. (2016). Designing for digital transformation. *MIS Quarterly*, *40*(2), 267–278. https://doi.org/10.25300/misq/2016/40:2.03

Mauro, T. G., & Borges-Andrade, J. E. (2020). Human resource system as innovation for organisations. *Innovation & Management Review*, *17*(2), 197–214. https://doi.org/10.1108/INMR-03-2019-0037

Munir, M., & Djaelani, M. (2022). Information Technology and Repositioning of Human Resource Management Functions. *Journal of Social Science Studies (JOS3)*, *2*(2), 50–55. https://doi.org/10.56348/jos3.v2i2.28

Noe, R. A., Clarke, A. D. M., & Klein, H. J. (2014). Learning in the twenty-first-century workplace. *Annu. Rev. Organ. Psychol. Organ. Behav.*, *1*(1), 245–275. https://doi.org/10.1146/annurev-orgpsych-031413-091321

Nugroho, M. A., & Andryzal Fajar, M. (2017). Effects of Technology Readiness Towards Acceptance of Mandatory Web-Based Attendance System. *Procedia Computer Science*, *124*, 319–328. https://doi.org/10.1016/j.procs.2017.12.161

Odlum, M. (2016). Technology readiness of early career nurse trainees: Utilization of the Technology Readiness Index (TRI). In *Studies in Health Technology and Informatics* (Vol. 225, pp. 314–318). IOS Press. https://doi.org/10.3233/978-1-61499-658-3-314

Parasuraman, A. (2000). Technology Readiness Index (Tri): A Multiple-Item Scale to Measure Readiness to Embrace New Technologies. *Journal of Service Research*, *2*(4), 307–320. https://doi.org/10.1177/109467050024001

Peng, M. Y. P., & Yan, X. (2022). Exploring the Influence of Determinants on Behavior Intention to Use of Multiple Media Kiosks Through Technology Readiness and Acceptance Model. *Frontiers in Psychology*, *13*, 852394. https://doi.org/10.3389/fpsyg.2022.852394

Presidential Regulation No. 86 Year 2007 about Badan Pusat Statistik, Pub. L. No. 86 (2007). https://peraturan.bpk.go.id/Details/42158/perpres-no-86-tahun-2007

Rajawat, M. S., & Sharma, N. (2022). Statistical Analysis and Significance of Information and Communication Technology based Improved Human Resource Information System (HRIS) in HR Performance for Banking and Financial Systems. *International Journal of Intelligent Systems and Applications in Engineering*, *10*(1s), 243–247. https://ijisae.org/index.php/IJISAE/article/view/2287

Sidek, S., Rahman, A. A., & Saif, A. N. M. (2022). HRIS implementation in apparel manufacturing industry of developing economy: Identification of challenges through qualitative systematic review and bibliographic exploration. *International Journal of Business Information Systems*, *1*(1), 1. https://doi.org/10.1504/ijbis.2022.10049738

Taherdoost, H. (2019). What Is the Best Response Scale for Survey and Questionnaire Design; Review of Different Lengths of Rating Scale / AttitudeScale / Likert Scale. *International Journal of Academic Research in Management (IJARM)*, *8*(1), 2296–1747. https://hal.science/hal-02557308

Taib, A., Awang, Y., Shuhidan, S. M., Rashid, N., & Hasan, M. S. (2022). Digitalization in Accounting: Technology Knowledge and Readiness of Future Accountants. *Universal Journal of Accounting and Finance*, *10*(1), 348–357. https://doi.org/10.13189/ujaf.2022.100135

Tannenbaum I. Scott. (1990). Human Resource Information Systems User Group Implications. *Journal of Systems Management*, *41*(1), 27–27.

Tansey, O. (2009). *Process Tracing and Elite Interviewing: A Case for Non-probability Sampling BT - Methoden der vergleichenden Politik- und Sozialwissenschaft: Neue Entwicklungen und Anwendungen* (S. Pickel, G. Pickel, H.-J. Lauth, & D. Jahn (eds.); pp. 481–496). VS Verlag für Sozialwissenschaften. https://doi.org/10.1007/978-3-531-91826-6_24

Troshani, I., Jerram, C., & Hill, S. R. (2011). Exploring the public sector adoption of HRIS. *Industrial Management and Data Systems*, *111*(3), 470–488. https://doi.org/10.1108/02635571111118314

Tsaramirsis, G., Kantaros, A., Al-Darraji, I., Piromalis, D., Apostolopoulos, C., Pavlopoulou, A., Alrammal, M., Ismail, Z., Buhari, S. M., Stojmenovic, M., Tamimi, H., Randhawa, P., Patel, A., & Khan, F. Q. (2022). A Modern Approach towards an Industry 4.0 Model: From Driving Technologies to Management. *Journal of Sensors*, *2022*(1), 5023011. https://doi.org/10.1155/2022/5023011

Weiner, B. J. (2009). A theory of organizational readiness for change. *Implementation Science*, *4*(1), 67. https://doi.org/10.1186/1748-5908-4-67

Williams, B., Onsman, A., & Brown, T. (2010). Exploratory factor analysis: A five-step guide for novices. *Journal of Emergency Primary Health Care*, *8*(3), 1–13. https://doi.org/10.33151/ajp.8.3.93

Xiao, J., Han, L., & Zhang, H. (2022). Exploring Driving Factors of Digital Transformation among Local Governments: Foundations for Smart City Construction in China. *Sustainability (Switzerland)*, *14*(22), 14980. https://doi.org/10.3390/su142214980

Zaman, M., Novitasari, D., Goestjahjanti, F. S., Fahlevi, M., Nadeak, M., Fahmi, K., Setiawan, T., & Asbari, M. (2020). Effect of readiness to change and effectiveness of transformational leadership on workers' performance during COVID-19 pandemic. *Solid State Technology*, *63*(1), 185–200.